

REMARKS

The specification has been amended to make editorial changes to place the application in condition for allowance at the time of the next Official Action.

Figure 3 is deleted to address the specification objection noted in the Official Action. Since Figure 3 was on a sheet by itself and since there was no description of Figure 3 in the body of the specification, the deletion of Figure 3 is believed compliant with the rule changes for amendment practice effective July 30, 2003.

Claims 10-14 were previously pending in the application. New claims 19-30 are added. Therefore, claims 10-14 and 19-30 are presented for consideration.

Claim 10 is rejected as unpatentable over COLEMAN 4,226,897.

Reconsideration and withdrawal of this rejection are respectfully requested because the reference does not teach or suggest introducing a support plate into a carbonate material environment, as recited in claim 10 of the present application.

As disclosed on page 1, lines 5-11 of the present application, for example, the non-oxidized stainless steel support plate when it is part of a fuel cell, is located on

the anode side of the fuel cell and subjected to an aggressive environment resulting from carbonate material.

The device of Figure 2c of COLEMAN is a semiconductor device which is subjected to silane gases to increase the Schottky barrier voltage when an active conducting coating is applied. The resultant device is used in a solar cell. Such solar cell is not a fuel cell that is subjected to a carbonate material environment. Accordingly, COLEMAN does not teach or suggest introducing a support plate to a carbonate material environment, as recited in claim 10 of the present application.

In addition, page 3 of the Official Action states that one of ordinary skill in the art would have recognized that stainless steel does not readily oxidize, and since COLEMAN does not indicate a desire to oxidize stainless steel, one of ordinary skill in the art would find it obvious to use non-oxidized stainless steel.

This assertion is not supported by the state of the art. Specifically, providing a coating on a non-oxidized stainless steel is a deliberate step done, for example, by plasma spray under atmospheric pressure or high velocity oxygen flame spraying. The layers of COLEMAN are formed by a glow-discharge apparatus with specific gases being used for

each particular layer. COLEMAN does not teach or suggest providing a coating on a non-oxidized stainless steel.

Further, the Official Action states that COLEMAN does not indicate a desire to oxidize the stainless steel. The obverse is also true in that COLEMAN does not indicate a desire to prevent oxidation of the stainless steel. Therefore, one of ordinary skill in the art would have two choices-- preventing oxidation or oxidizing the stainless steel. Accordingly, when there is more than one path to follow, the desired path would not be obvious, and thus one having ordinary skill in the art would not find it obvious to use non-oxidized stainless steel.

Claims 10 and 11 are rejected as unpatentable over DE 19523637 in view of COFFINBERRY et al. 5,805,973.

Reconsideration and withdrawal of this rejection are respectfully requested because the references do not disclose or suggest introducing the support plate into a carbonate material environment wherein applying a diffusion barrier layer comprises the application of a titanium oxide-containing compound before applying a nickel layer as recited in claim 10 of the present application.

MPEP §2143(01) states that: "The mere fact that references can be combined or modified does not render the resultant combination obvious unless the prior art also

suggests the desirability of the combination." *In re Mills*,
916 F.2d 680, 16 USPQ 2d 1430 (Fed. Cir. 1990).

The Official Action states it would be obvious to substitute the titanium oxide layer taught by COFFINBERRY et al. for the titanium nitride layer disclosed by DE 19523637. However, this assertion is not supported by the reference. Specifically, as disclosed at column 8, lines 52-54 of COFFINBERRY et al., COFFINBERRY et al. is applicable to any hydrocarbon fluid or fuel in which gum, coke, and/or sulfur compounds form when the fluid is exposed to heat. In the environment of COFFINBERRY et al., the titanium oxide coating has a catalytic effect and disadvantageously promotes deposits. COFFINBERRY et al. do not teach or suggest a titanium oxide layer can be used as part of a support plate in a carbonate material environment to prevent stainless steel elements from reacting with (earth) alkali elements. Accordingly, there is insufficient motivation to modify DE 19523637 as suggested in the Official Action and thus the resultant combination would not be obvious.

In addition, COFFINBERRY et al. do not teach or suggest that a titanium oxide layer could replace a titanium nitride layer. Accordingly, the combination of DE 19523637 and COFFINBERRY et al. would necessarily result in a diffusion barrier layer having a titanium oxide layer and a

titanium nitride layer. Since both layers are diffusion barrier layers, one of ordinary skill in the art would not find it obvious to waste additional time and money to apply a two-layer coating when DE 19523637 teaches that a single titanium nitride layer is sufficient for a diffusion barrier layer. Therefore, the proposed combination of references would not render obvious claims 10 and 11 of the present application.

Claims 12-14 are rejected as unpatentable over DE 19523637 in view of COFFINBERRY et al. and further in view of McKEE 6,335,105. This rejection is respectfully traversed.

McKEE is only cited for the teaching of applying a diffusion barrier coating of titanium oxide to a stainless steel substrate by high velocity oxyfuel spray where a NiCrAlY bond coat is applied to the substrate in order to enhance adhesion of the barrier layer to the substrate. McKEE does not teach or suggest what is recited in claim 10 of the present application. As set forth above, DE 19523637 in view of COFFINBERRY et al. do not teach or suggest what is recited in claim 10. Since claims 12-14 depend from claim 10 and further define the invention, the combination of references would not render obvious claim 10.

In addition, the invention of McKEE is related to a superalloy that is part of gas turbine engine. One of ordinary skill in the fuel cell art would not look to the gas turbine engine art for teachings of a coating method for a fuel cell.

New claim 19 also includes the step of placing a support plate in direct contact with a carbonate material environment. The comments above regarding claim 10 are equally applicable to claim 19.

Claims 20-29 depend from claim 19 and further define the invention and are also believed patentable over the cited prior art.

In addition, claims 20-29 also include features not disclosed in the combination of references. For example, claim 23 recites that one of the diffusion barrier layer and the adhesion layer is between 40 and 50 μm . Claim 24 provides that the adhesion layer comprises an NiCrAlY powder having the particle size of between 10 and 45 μm . Claim 25 provides that the diffusion barrier layer is directly over the substrate. Claim 27 provides that the diffusion barrier layer has a starting material that is a powder having a particle size of between 5 and 20 μm . Claim 28 provides that the powder of claim 27 is a pentavalent ion, and claim 29 provides that the pentavalent ion is one of niobium and

tantalum. None of these features are disclosed in the references and thus these claims are believed patentable regardless of the patentability of the claims from which they depend.

New claim 30 recites the step of applying a diffusion barrier layer containing a titanium compound to an anode side of a support plate and applying a nickel layer to the diffusion barrier wherein the diffusion barrier layer comprises titanium oxide. These features are not taught or suggested by the references, either alone or in combination, and thus claim 30 is also believed patentable over the cited prior art.

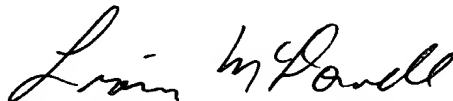
In view of the present amendment and the foregoing remarks, it is believed that the present application has been placed in condition for allowance. Reconsideration and allowance are respectfully requested.

The Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 25-0120 for any

additional fees required under 37 C.F.R. § 1.16 or under 37
C.F.R. § 1.17.

Respectfully submitted,

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APPENDIX:

The Appendix includes the following item(s):

- an amended Abstract of the Disclosure

Application No. 09/807,025
Amdt. Dated September 12, 2003
Reply to Office Action of May 12, 2003
Docket No. 2001-1164

ABSTRACT OF THE DISCLOSURE

--Method for coating a non-oxidised stainless steel support plate and a MCFC fuel cell stack provided with a separator plate coated in this way. First a diffusion barrier layer and then a nickel layer are applied to the anode side of ~~[[said]]~~ the support plate. ~~[[Said]]~~ The diffusion barrier layer consists of titanium oxide and the adhesion between titanium oxide and the support plate can be improved by providing an adhesion layer.--